9/07/04 IFW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: **Mark E. Kershaw**

Serial No.: **10/800,519**

Filing Date: **March 15, 2004**

Title: **Protective Body Armour**

Group Art Unit: **3765**

Examiner:

Attny. Docket No. **075254.0102**

Client Ref.: **RG-103US**

Mail Stop Priority Document
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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SUBMISSION OF PRIORITY DOCUMENT

Dear Sir:

We enclose herewith a certified copy of Great Britain Application No. 0122328.8 filed on September 15, 2001, which is the priority document for the above-referenced patent application.

Respectfully submitted,
BAKER BOTTS L.L.P. (023640)

Date: September 3, 2004

By: _____
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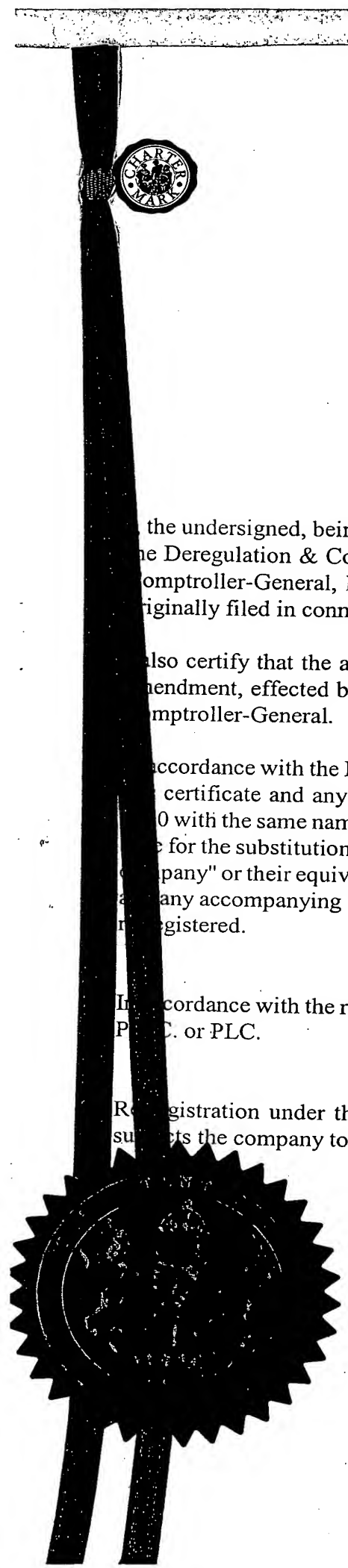

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, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of he Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the omptroller-General, hereby certify that annexed hereto is a true copy of the documents as iginally filed in connection with the patent application identified therein.

lso certify that the attached copy of the request for grant of a Patent (Form 1/77) bears an endment, effected by this office, following a request by the applicant and agreed to by the mptroller-General.

ccordance with the Patents (Companies Re-registration) Rules 1982, if a company named in certificate and any accompanying documents has re-registered under the Companies Act 0 with the same name as that with which it was registered immediately before re-registration for the substitution as, or inclusion as, the last part of the name of the words "public limited pany" or their equivalents in Welsh, references to the name of the company in this certificate any accompanying documents shall be treated as references to the name with which it is so egistered.

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Signed J Evans.

Dated 19 August 2004

Patents Form 1/77

Patents Act 1977
(Rule 16)

1/77

THE PATENT OFFICE
N
15 SEP 2001
NEWPORT

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road
Newport
South Wales
NP10 8QQ

1. Your reference RG - 103GB see PF51177.

17SEP01 E660234-1 C77619
P01/7700 0.00-0122328.8

2. Patent application number *(The Patent Office will fill in this part)* **0122328.8**

15 SEP 2001

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

SPORTSFACTORY CONSULTING LTD
WARRINGTON BUSINESS PARK,
LONG LANE,
WARRINGTON,
CHESHIRE, WA2 8TX.

Patents ADP number *(if you know it)* 8227555001

If the applicant is a corporate body, give the country/state of its incorporation UNITED KINGDOM

4. Title of the invention

PROTECTIVE BODY ARMOUR

5. Name of your agent *(if you have one)*

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PF51177
24.08.02

MARK KERSHAW,
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LONG LANE,
WARRINGTON,
CHESHIRE, WA2 8TX

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

Patents ADP number *(if you know it)* 08252751001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*

a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d))

YES

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form	–
Description	~~8~~ 3
Claim(s)	1
Abstract	1
Drawing(s)	1 + 1

10. If you are also filing any of the following, state how many against each item.

Priority documents	
Translations of priority documents	
Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	
Request for preliminary examination and search *(Patents Form 9/77)*	
Request for substantive examination *(Patents Form 10/77)*	
Any other documents *(please specify)*	

11. ~~I~~/We request the grant of a patent on the basis of this application.

Signature M.E. Kershaw Date 12.09.01

12. Name and daytime telephone number of person to contact in the United Kingdom

MARK KERSHAW
01925 - 474-476

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After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

Notes

a) If you need help to fill in this form or you have any questions, please contact the Patent Office on 08459 500505.

b) Write your answers in capital letters using black ink or you may type them.

c) If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.

d) If you have answered 'Yes' Patents Form 7/77 will need to be filed.

e) Once you have filled in the form you must remember to sign and date it.

f) For details of the fee and ways to pay please contact the Patent Office.

DUPLICATE

PROTECTIVE BODY ARMOUR

This invention relates to articles of protective body armour for sports, leisure, motorsport and industrial applications.

Body Armour is widely used in many sport and non-sporting applications to provide a level of protection from impact on the wearer.

Conventional body armour normally consists of a hard plastic outer shell, (injection moulded, blow moulded or thermoformed) with a backer of a softer compressible material, ie foam. The backer provides cushioning whilst the outer shell helps distribute the impact load across a wider area thus reducing direct (point) loading. Body armour is normally secured onto the wearer by strapping closure systems, ie elastics, Velcro or enclosed within garments worn by the user.

There exists the science of "biomimetics" ("the abstraction of good design from nature"). These ideas from biology can be applied within such disciplines as chemistry, engineering and materials science.

One such good design is the 6 sided honeycomb which is constructed by insects such as bees and wasps to make protective enclosures. The honeycomb structure of 6-sided hexagons has been suggested as one of the strongest in the natural world, due to the hexagons geometric shape.

A number of companies have, over the years, introduced shock absorbing / energy protection devices in footwear and body armour utilizing honeycomb construction bonded to a skin. Reebok – Hexalite, Puma – cell, Umbro – Trauma-Lite. Honeycomb structure is also widely used in aerospace and motor industries due to its superb lightweight to stiffness capability.

However the honeycomb has always been constructed as a "sandwich " or an insert. That is an outer skin applied through a 2nd stage ie, adhesive bonding, welding etc onto the honeycomb to provide the finished form, or as an insert through a window within a unit. The honeycomb being promoted as the shock absorbing, strengthening device. Sandwich inserts are, however, relatively expensive through cost and assembly.

According to the present invention there is provided one piece skin / honeycomb construction through any of the following one stage manufacturing processes – injection moulding, blow moulding, sintering, vacforming, compression moulding.

The invention can claim to be inventive as it is radically changing the capability of an outer shell / surface to provide anti-ballistic protection due to the inclusion of a hexagon honeycomb structure on its reverse side. The honeycomb structure providing extra shock absorbing / energy dissipation function. This invention allows for a greater degree of flexibility necessary for body fit and ergonomic function.

The honeycomb is of a "walled" 6 –sided hexagon geometric pattern. The size of the honeycomb is not fixed. Pattern size can vary throughout the wall depending where protection / flexibility are required.

The surface of the skin may also extend through and into the void of each honeycomb hexagon to provide additional strength and shape retention of the article.

A specific embodiment of the invention will now be described by way of example with reference to the accompanying drawing in which:-

Fig 1 Shows a plan view of a one piece skinned hexagonal walled honeycomb.

Fig 2 Shows the cross sectioned view A-A taken across Fig 1 illustrating the honeycomb skin panel.

Fig 3 Shows a honeycomb skinned panel of walled hexagonals of varying sizes.

Fig 4 Shows the skin extension through a welled hexagon of the honeycomb.

Fig 5 Shows the cross-sectional view B-B taken across Fig 4 illustrating the wall extension through the hexagon walled void.

Fig 6 Shows another type of skin extension through the walled hexagon of the honeycomb.

Referring to the drawing the structure comprises of an outer skin 1 incorporating a number of six sided hexagon walls 2 forming a honeycomb structure on one side 3.

The honeycomb size throughout the skin can be uniform and non-uniform in size – ie not fixed throughout the panel 4.

The surface of the skin may also extend through and into the void of each honeycomb hexagon to provide additional strength and shape retention to the article. 5 and 6 are such examples of this stiffening.

CLAIMS

1. A one piece protective panel / skin incorporating a hexagonal walled honeycomb on one side.

   This panel / skin being manufactured by either injection moulding, blow moulding, sintering, vac-forming or compression moulding.

2. A one piece protective panel / skin as claimed in Claim 1 wherein:

   The walled hexagonal honeycomb can vary in size to accommodate flexing and ergonomic function.

3. A one piece protective panel / skin as claimed in Claim 1 or Claim 2 where:

   Extension of the skin comes through and into the honeycomb voids to provide additional strength and shape retention.

ABSTRACTS

PROTECTIVE BODY ARMOUR

A protective panel / skin 1 incorporating a number of six sided hexagonal walls 2 on one side forming a honeycomb structure 3 which can be used for providing increased levels of protection from impact upon the wearer. This panel / honeycomb is produced in one manufacturing process, ie injection moulding, blow moulding, sintering, vac-forming or compression moulding.

The hexagonal honeycomb can vary in size to accommodate flexing and ergonomic function.

(Use figure 3)

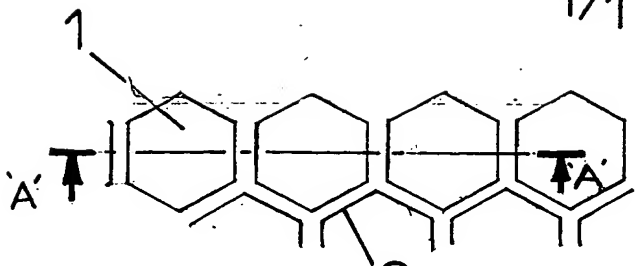


FIG 1

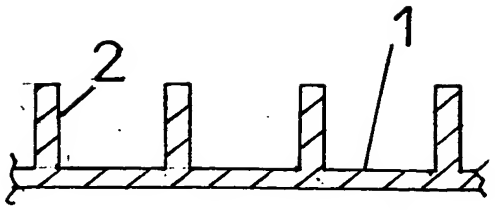


FIG 2

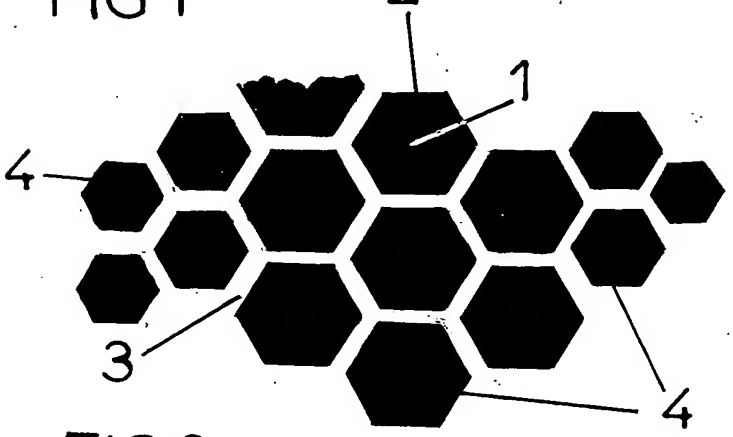


FIG 3

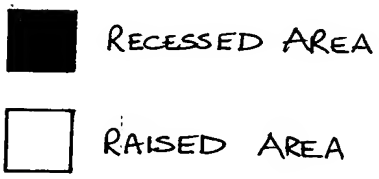
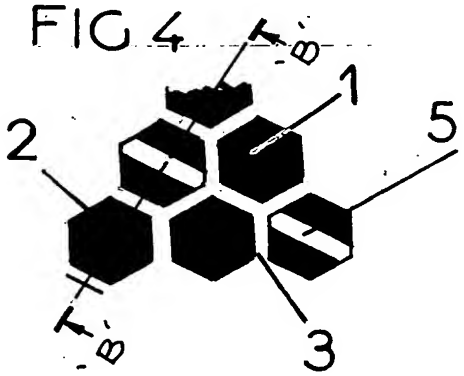


FIG 4



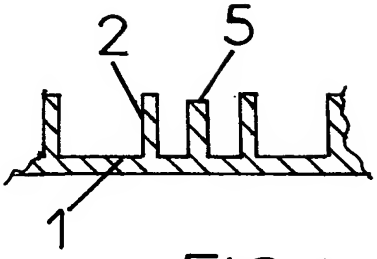


FIG 5

FIG 6